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CURRENT LITERATURE.

The Buitenzorg Botanic Garden.

Botanic gardens are not common in America, and moreover their usefulness is not generally recognized. From an economic and commercial point of view they are not considered of sufficient value to pay for their maintenance. Even from the purely scientific side of the subject the opinion is by no means unanimous that they are worth as much as they cost. There are good and sufficient reasons for this state of affairs, which, however, need not be rehearsed in this connection. Recently some indications of a change in popular and scientific sentiment have been apparent, encouraged especially by the prominence and acknowledged success of the Missouri Botanic Garden. Probably the botanical public has never been more ready to learn about botanic gardens, their history, their aims, their resources, than now. The recent appearance of the memorial volume¹ commemorating the seventy-fifth anniversary of the founding of the botanic garden at Buitenzorg, Java, is therefore opportune.

The memorial volume was first published in Dutch, but has been translated into German, and a dozen handsome views of the garden added, for the convenience of European botanists, a form that will also, no doubt, be acceptable on this side of the Atlantic. The volume contains, as an introduction, the anniversary address of Dr. M. Treub, the director, upon the "value of a tropical botanic garden," and also very interesting articles giving a history of the garden, description of a stroll through the garden, an account of the herbarium and museum, a descriptive and classified list of the scientific investigations conducted at the garden, and an account of the more important economic plants cultivated, as well as several lists of plants, books, visiting investigators, etc., prepared by the several members of the garden staff. Nearly the whole volume will prove of much interest to botanists in general, quite apart from its local application.

The seventy-five years (now nearly seventy-seven years), of existence of the Buitenzorg garden have seen great changes in its fortunes. Founded in 1817 to secure, test and distribute seeds and cuttings of useful plants to the Dutch colonies, it flourished for nearly a decade, then for a dozen years was reduced to inactivity and nearly abolished

¹Der botanische Garten, "'s Lands Plantentuin," zu Buitenzorg auf Java: Festschrift zur Feier seines 75-jährigen Bestehens (1817-1892). Leipzig, Wilhelm Engelmann, 1893. Roy. 8vo. 426 pp. 12 photogravures. 4 maps. M. 14.

through political influence. In 1830 a young gardener, twenty years of age, Mr. J. E. Teijsmann, without scientific training, but with great energy, perseverance and sound judgment, was placed in charge. For more than half a century he directed the fortunes of the garden, raising it from a state of lethargy to one of usefulness, and causing it on the whole to make wonderful development, although through political and other misfortunes it several times met with disheartening reverses. In 1844 the large and important herbarium was ordered to be sent to Holland, to the Royal Herbarium at Leyden, a loss to the garden still felt in the study of the native flora, although the present collection is very large.

The library possesses about 2,400 volumes, more than half being exclusively botanical, also 165 periodicals. Large collections of vegetable products of various kinds form an attractive museum for study and instruction. The garden covers 144 acres, and abounds in beautiful landscape effects, noble trees, and a wealth of tropical plants, numbering over 9,000 species. The principal buildings are the museum, the agricultural-chemical laboratory, the pharmacological laboratory, the studio for photography and engraving, the large botanical laboratory (where visiting botanists work), and the offices and small botanical laboratory. The staff consists of fifteen members beside the director; the labor of caring for the garden is performed by about 200 native Javanese.

Although the garden was founded and has been maintained for practical ends, it has of late years attained a high reputation for its scientific researches, partly published in the *Annales* of the garden, and partly elsewhere. The present management has provided facilities for visiting botanists, the laboratory for their use being opened in 1885, and encourages the freest use of the same. The visiting list is already long, including many well known names, such as Professors Solms-Laubach (Strassburg), Goebel (Munich), Tschirch (Berlin), Schimper (Bonn), Stahl (Jena), Haberlandt (Graz), and others. The favorite time for a visit appears to be from November to March, although some visitors are likely to be found in the laboratory at all times of the year.

This notice is given for the purpose of calling attention both to a valuable and attractive book, and to a tropical laboratory where American investigators will find a hearty welcome and rare facilities for study of vegetation under the tropics.

Botany of the Death Valley Expedition.

This report not only deserves notice for its own sake, but also as representing the result of the first attempt by the government to conduct a biological survey from the botanical standpoint. The result certainly indicates the great advantage of having trained botanists as well as collectors in the field. Compared with the usual bare lists, with such meager information as collectors have made possible, the present report belongs to an entirely different class. Mr. Coville is known to be very systematic, and the parts follow each other with all the precision and fulness of an encyclopedia. The summary shows that the catalogue contains 1,261 species and varieties, forty-two of which are characterized as new. Two genera are proposed as new, viz.: *Orochaenactis* (founded upon *Chenactis thysanocarpa* Gray) and *Phyllogonum* (a peculiar member of the Eriogonææ). *Fremontodendron* is proposed as a substitute for *Fremontia* under the rule of homonyms. As interesting as is the catalogue of species, with its very full and very valuable notes, the most significant part of the report is that which deals with the principles of plant distribution in general, the distribution of plants in southeastern California, and the characteristics and adaptations of the desert flora. The treatment of the general subject of distribution is best indicated in the following summary given by the author:

"To sum up, the six ultimate factors in the distribution of vegetation are heat, light, water, food, air and mechanic. These factors are variously combined in actual fact into such conditions, among others, as geographic isolation, latitude, altitude, rainfall, soil, fires, proximity to large bodies of water, slope exposure, and presence of forests."

Attention is called also to the fact that trees and shrubs are the best zonal guides, as illustrated by the *Larrea* zone (Lower Sonoran), in which occurs a *Grayia* belt. In treating of the distribution of plants in S. E. California, the desert plants east of the Cordilleran system are considered, the plants of the high Californian Sierras (which were found to show as close an affinity to those of the Rockies of Colorado as to those of the Oregon and Washington Cascades, which is taken to indicate a former boreal communication across Nevada and Utah), and those of Death Valley proper. The last show, what was to be expected, a northern extension of Sonoran and Chihuahuan types. The characteristics and adaptations of the desert flora

¹ COVILLE, FREDERICK VERNON:—Botany of the Death Valley Expedition. A report on the Botany of the Expedition sent out in 1891 by the U. S. Department of Agriculture to make a biological survey of the region of Death Valley, California. 8vo. pp. 318, with 21 plates and map. Contributions U. S. Nat. Herbarium, Vol. IV, 1893.

is a subject so full of interest that it cannot fairly be treated in our limited space. There is presented the source and distribution of moisture, the conservation of moisture, the temperature and seasons of the region, a classified list of the desert plants, and general and special adaptations. Under general adaptations the absence of trees is noted, and the size, spacing, and form of the characteristic shrubby vegetations in their relation to each other and the struggle for moisture. The marked special adaptations are also to be found chiefly among the shrubs, as the plants "subjected to all the seasonal changes of many years." Naturally these special adaptations have to do chiefly with modifications for reducing transpiration, and also rapid radiation, and quite a list of plants is given with the modification in each case. This part of the report, however, deserves careful reading, and the whole stands as the most important one of the Contributions of the National Herbarium yet issued. It is also a matter of great congratulation that the twenty-one plates accompanying the report are of the best quality and not the rough ones that have been too common in the "Contributions."

A Flora of French Polynesia.¹

Any account of the plants of the Southern Pacific is looked to with interest. The book before us is a regular manual, and looking through its pages at once suggests a strange flora to one chiefly acquainted with north temperate regions. The structure of the islands, their topography, and the conditions of climate are described. All combine to favor a luxuriant vegetation, one more brilliant than varied, and chiefly remarkable for the number of individuals. The great display of evergreen and suffrutescent species is noted, followed by trees and shrubs, then annuals representing a very insignificant part of the vegetation. The largest families, in the order of their importance, are Ferns, Leguminosæ, Orchidaceæ, Rubiaceæ, Gramineæ, Cyperaceæ, Euphorbiaceæ, and Urticaceæ. The usually dominant family of Compositæ is feebly represented, but it is interesting from the woody and arborescent forms it contains. The author considers the Polynesian Compositæ to be American in their affinities. The species of French Polynesia can be thrown into three categories, (1) those that are peculiar to it, (2) those which it has in common with Oceanica exclusive of Malaysian flora, (3) those in common with the Indo-Malaysian region. The first group contains 28.9 per cent. of the flora, the second 20.8 per cent and the third more than the other two combined. The number of species described is 744, of which 144 are ferns.

¹DEL CASTILLO, E. DRAKE:—*Flore de la Polynésie Française, description des plantes vasculaires qui croissent spontanément ou qui sont généralement cultivées aux îles de la Société, Marquises, Pomotou, Gambier et Wallis.* 8vo. xxiv. 352, with colored maps. Paris. G. Masson. 1892.

Minor Notices.

PROFESSOR L. H. PAMMEL, in connection with an account of *Sclerotinia libertiana*, has published a very valuable bibliography of fungus root diseases, containing considerably over 500 titles. The paper appears in Trans. St. Louis Acad. 6: 191-232. 1893.

JUNCUS MARGINATUS and its varieties are discussed by Mr. F. V. Coville in a recent excerpt from Proceedings of the Washington Biological Society. The forms of this widely variable species have been variously treated. Mr. Coville separates the species into three forms, characterized as *J. marginatus* (type form), *J. marginatus aristulatus*, and *J. marginatus setosus*, the last of which has never happened to be characterized. Some useful suggestions are also made as to the treatment of such groups.

MR. WILLIAM E. MEEHAN'S "Contribution to the flora of Greenland" has been distributed as a reprint from the Proceedings of the Philadelphia Academy. As is well known, this reports the botanical results of the Peary expedition, the collections being made by Messrs. Burk and Meehan. Just 100 species of phanerogams and pteridophytes are enumerated. The profusion of lichens and mosses is remarked, thirty-nine species of the former, and twenty-eight of the latter being noted.

THE REPORTS of the State Botanist of New York for 1891 and 1892 are just at hand. The former contains a revision of the New York species of *Omphalia*, twenty-one in number, besides the descriptions of seventeen new fungi. The latter contains an account of the New York species of *Pleroteolus* and *Galera*, besides the descriptions of thirty-seven new fungi. It is stated that forty quarto plates of edible (59 species) and poisonous (3 species) mushrooms have been prepared, drawn full size, in color. These are ready for publication, together with suitable explanatory text. Their early appearance will delight all mycologists and mycophagists.

DR. WM. TRELEASE has been studying the winter condition of our maples, and also the confused sugar maples.¹ The treatment of the sugar maples has been so various that the synonymy is badly tangled. Dr. Trelease recognizes three species of the group SACCHARINA, namely, *A. saccharum* Marsh. (*A. saccharinum* of the Manual) with its varieties *barbatum* (*A. barbatum* Michx.) and *nigrum* (*A. saccharinum*, var. *nigrum* of the Manual); *A. Floridanum* Pax., with its variety *acu-*

¹TRELEASE, WILLIAM:—Sugar maples, and maples in winter. Reprinted in advance from the 5th Ann. Rep. of the Mo. Bot. Gard. pp. 20 with 13 plates. January 1, 1894.

minatum; and *A. grandidentatum* Nutt. All these forms become varieties of *A. barbatum* in Sargent's *Silva*. This part of the contribution is illustrated by ten plates. The second part presents a winter synopsis of all North American maples, and with the help of three plates not only shows the possibility of determinations in the winter condition, but also develops new specific characters.

PROFESSOR S. C. MASON has published in the Eighth Biennial Report of the State Board of Agriculture a preliminary report upon the variety and distribution of Kansas trees.

DR. J. H. WAKKER opens a series of reports from the East Java Experiment Station¹ consisting of articles extracted from the archives of the Java Sugar-Industry, and treating of the diseases of sugar-cane and the improvement of cane by use of seed.

TWO PAPERS upon the flora of Wisconsin have been issued in the ninth volume of the Transactions of the Wisconsin Academy, and separates were distributed in advance of publication of the volume. These are "A preliminary paper on the flora of Dane county," by L. S. Cheney and R. H. True, and "A supplementary list of parasitic fungi of Wisconsin," by J. J. Davis. The first is prefaced by a brief account of the climatic and geologic conditions of the range covered and accompanied by a topographic map reproduced from the sheets of the U. S. G. S. It includes spermaphytes, pteridophytes and bryophytes. The second paper is supplementary to Trelease's list of the fungi of Wisconsin prepared in 1882.

THE SERIES of bulletins from the laboratories of natural history of the state University of Iowa has just now reached the close of the second volume. The current number contains ten papers, six of which are botanical. Mr. B. Shimek gives a full account of the botanical expedition to Nicaragua, which seems to have been very successful in the collection of material and notes; Professor McBride furnishes four numbers, namely, an account of the Nicaraguan Myxomycetes (which are strikingly like those of the northern United States, of the twenty-five species collected nineteen being identical with those commonly found in eastern Iowa, and the six new ones representing familiar genera), a continuation of the presentation of the myxomycetes of eastern Iowa (nine species, two of them being new), the description of a new *Physarum* from Colorado, and the description of a new fossil cycad (*Bennettites*) from the Jura-Trias of S. Dakota; and

¹Mededeelingen Proefstation "Oost-Java." Nieuwe Serie. Roy. 8vo. Soerabaya 1893. No. 1, De bladziekten te malang, 7 pp. No. 2, Djamoer oepas op arrowroot en andere planten, 6 pp. No. 5, Onze zaadplanten van het jaar 1893, 13 pp.

Mr. Chas. L. Smith presents a synoptical view of Central American Pyrenomycetes, with descriptions of new species.

ANOTHER ONE of the "Contributions from the U. S. National Herbarium", being no. 8 of vol. I, has lately appeared, being of special interest as containing all the unpublished botanical manuscript of the late Dr. George Vasey, except that which had been prepared for the concluding part of his Monograph of the Grasses of the United States and British America. This material appears under the titles "Notes on some Pacific Coast Grasses" (in which 8 species are considered), "Descriptions of new or noteworthy grasses from the U. S." (in which over 30 new species are described, 17 of which belong to *Poa*), and "Descriptions of new grasses from Mexico" (16 in number). In addition to these numbers, Mr. J. M. Holzinger describes four new species from Texas and Colorado, and gives a list of 17 plants, new to Florida, collected by J. H. Simpson; Mr. J. N. Rose describes 3 new plants; and Mr. J. W. Eckfeldt gives a list of 42 lichens from California and Mexico, collected by Dr. Palmer from 1888 to 1892.

"BULLETIN of the Maine State College Laboratory of Natural History" is the descriptive title of another local publication to be issued at irregular intervals. The opposition of the GAZETTE to the multiplication of serials of an uncertain life tenure and limited distribution is well-known. The present instance appears less objectionable than usual, as the number before us (Vol. I, no. 2) contains only matter of local interest. It is dated January, 1893, although the number reached us only last month (Jan. 1894). It consists of two bare lists with localities, both prepared by F. L. Harvey and E. P. Briggs, one of the phanerogams and vascular cryptogams of the Blake Herbarium, "as it came to the college" (the only information descriptive of the collection), enumerating about 3,500 species, and the other of the phanerogams and vascular cryptogams of the state, principally from the vicinity of Orono, the college town, numbering less than a thousand species.